

## REMARKS

The last Office Action of November 8, 2002 has been carefully considered. Reconsideration of the instant application in view of the foregoing amendments and the following remarks is respectfully requested.

Claims 1-11 are pending in the application. No claims have been canceled, amended or added.

Claims 1-3 and 6-9 stand rejected under 35 U.S.C. §103(a) as being unpatentable Niina, of record, in view of U.S. Pat. No. 6,203,634 (hereinafter "Volkmoth"), and "Technical Book, Ball and Roller Bearing (hereinafter" Technical Book").

Claims 4, 5, 10, and 11 stand rejected under 35 U.S.C. §103(a) as being unpatentable Niina in view of Volkmoth and Technical Book, and further in view of U.S. Pat. No. 6,6062,736 (hereinafter "Zernickel").

The rejection under 35 U.S.C. 103(a) is respectfully traversed.

The present invention is directed, in general, to a thrust ball bearing and, more particularly, to a scroll compressor having incorporated a thrust ball bearing which includes bearing disks made from through-hardenable ferrous material.

Niina describes a scroll compressor having bearing disks and bearing balls for rolling along a track. As admitted by the Examiner, Niina fails to disclose bearing disks made of through-hardenable ferrous material.

The Examiner based the §103(a) rejection on a combination of Niina with Volkmuth and Technical Book. Applicants respectfully disagree that the suggested combination produces the invention as set forth in claims 1 and 7.

Volkmuth refers to a method of **heat-treating** through-hardened bearing steel. The Examiner in particular refers to the passage in col. 5, line 65 to col. 6, line 1, where it is stated that “[T]he method of the present invention is described in the context of through hardened rolling bearing components. These components include rings, rollers, balls, washers and generally all parts of a rolling bearing made of through hardened bearing steel.”. This passage merely refers to the existence of through-hardened steel components, and how, in the context of the Volkmuth reference, the quality of existent through-hardened components can be improved. Applicants do not dispute the existence of through-hardened steel components nor do applicants even dispute the existence of through-hardened steel components for radial roller bearings, as, e.g., described in the Burkhardt reference, which has previously been applied by the Examiner.

Claims 1 and 7, as presently on file, are neither directed to the improvement of through-hardened steel components nor to the use of through-hardened steel components in radial roller bearing. Rather, claims 1 and 7 are directed to the construction of a **thrust ball** bearing designed to resist axial loads, and in particular to a scroll compressor, which incorporates a particular thrust ball bearing in order to support thrust force of an orbiting scroll member against a fixed scroll member.

Heretofore, nothing in the prior art teaches or suggests to make the races of thrust ball bearings or scroll compressors of through-hardened material. Thus, there would be no reason or motivation to combine Niina with Volkmuth, especially since Volkmuth merely intends to improve through-hardened components.

The Technical Book publication also merely refers to a method of through-hardening rolling bearing steels in the context of **roller**-type bearings. Nothing in this publication teaches or suggests a reference to make races of a **thrust ball** bearing or scroll compressor of through-hardened material. Please note that antifriction bearings are distinguished i.a. according to the shape of the rolling elements, namely between ball bearings and roller bearings. Technical Book relates to roller bearings and is silent as far as ball bearings are concerned.

Therefore, it is applicants' contention, that a combination of Niina with Volkmuth and Technical Book does not produce the present invention, nor would an artisan who is aware of Niina look to the Volkmuth and Technical Book references to make the modifications, as suggested by the Examiner. It appears also that the Examiner has cited a number of references variously containing some of the limitations in applicants' claims. However, these references and the limitations for which they were cited were combined piecemeal without any suggestion or motivation for their combination and without regard to the purpose of applicants' invention.

The Zernickel reference, which has been applied in combination with Niina, Volkmuth and Technical Book, to substantiate the rejection of claims 4, 5,

10 and 11, is directed to a radial rolling bearing. As stated previously, while the present invention and the Niina reference are directed to a thrust ball bearing designed to resist **axial** loads, the Zernickel reference is directed to an anti-friction bearing of the **radial** bearing type, designed to resist **radial** loads. Again, the Examiner applies a reference that is directed to radial roller bearings. Axial bearing and radial bearing differ, however, substantially as far as rolling conditions are concerned and thus cannot simply be compared. In particular, in conjunction with a scroll compressor, which the present invention is directed to (claims 7-11), the incorporation of a particular thrust bearing is involved in order to support thrust force of an orbiting scroll member against a fixed scroll member.

Thus, the Zernickel reference, relating to radial roller bearings, is not within the field of applicants' endeavor, and is not concerned with the problems facing applicant in the context thrust ball bearings. Therefore, it is applicants' contention that Zernickel is non-analogous art which a person skilled in the art would not refer to and combine with Niina.

Please note also that Zernickel merely mentions the use of a non-chipping shaping process. However, this is the extent of it. Nothing else is described in this regard. In particular, Zernickel is completely silent as to the shaping speed, as set forth in claims 5 and 10. As stated in paragraph [0012] of the instant specification. The low shaping speed  $\leq 2$  m/min and the inclusion of compressive stress ensures that the components can be made at great accuracy in shape and dimension, despite the presence of the alloying elements chromium and manganese which complicate the cold-shaping procedure. Moreover, the non-

cutting manufacturing process ensures a positive fiber pattern in the material, which is an additional precondition for realizing good fatigue strength.

For the reasons set forth above, it is applicant's contention that neither Niina nor Volkmuth, nor Technical Book, nor Zernickel, nor any combination thereof teaches or suggests the features of the present invention, as recited in claim 1, which is directed to a particular type of thrust ball bearing, and claim 7, which is directed expressly to a scroll compressor having incorporated therein this particular type of axial bearing.

As for the rejection of the retained dependent claims, these claims depend on claims 1 and 7, respectively, share their presumably allowable features, and therefore it is respectfully submitted that these claims should also be allowed.

Applicant believes that when the Examiner reconsiders the claims in the light of the above comments, he will agree that the invention is in no way properly met or anticipated or even suggested by any of the references however they are considered.

In view of the above presented remarks and amendments, it is respectfully submitted that all claims on file should be considered patentably differentiated over the art and should be allowed.

Applicant further submits a certified copy of the priority document under 35 U.S.C. §119(a)-(d).

Reconsideration and allowance of the present application are respectfully requested.

Should the Examiner consider necessary or desirable any formal changes anywhere in the specification, claims and/or drawing, then it is respectfully requested that such changes be made by Examiner's Amendment, if the Examiner feels this would facilitate passage of the case to issuance. If the Examiner feels that it might be helpful in advancing this case by calling the undersigned, applicant would greatly appreciate such a telephone interview.

Respectfully submitted,

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